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Steven Holdcroft

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EXAMINER

CANTELMO, GREGG

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/781,363	<b>Applicant(s)</b> HOLDCROFT ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-28 and 35-41 is/are pending in the application.
- 4a) Of the above claim(s) 14-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-13 and 35-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>SEE OFFICE ACTION</u> .                                       | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the amendment received December 18, 2007:
  - a. Claims 1-4, 6-28 and 35-41 are pending with claims 14-28 withdrawn from consideration as to a non-elected invention;
  - b. The drawing objection has been overcome in light of the replacement drawings;
  - c. The specification objections have been overcome in light of the amendment;
  - d. The 112 rejections have been withdrawn in light of Applicants arguments;
  - e. The double patenting rejection stands in light of the fact that the office has not received any terminal disclaimer indicated on page 19 of Applicants response;
  - f. The 102 rejections have been overcome in light of the amendment;
  - g. The 103 rejections to JP 53-029291 are withdrawn upon further consideration;
  - h. The prior art rejections to Kiefer as the primary reference stand as modified in response to the amendment.

### ***Election/Restrictions***

2. This application contains claims 14-28 are drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Information Disclosure Statement***

3. The information disclosure statements filed November 26, 2007 and December 18, 2007 have been placed in the application file and the information referred to therein has been considered as to the merits.

***Drawings***

4. The drawings were received on December 18, 2007. These drawings are approved.

***Specification***

5. The amendments to the specification have been entered and sufficiently overcome the prior objections to the specification.

***Claim Objections***

6. Claim 40 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In order for the electrochemical cell of claim 1 to effectively function as an electrochemical cell, it is inherent that the invention of claim 1 includes electrodes which are in contact with the electrolyte. If not, then it is not understood how the electrochemical cell of claim 1 can function without such contact. With that, claim 40 is not held to further limit claim 1, since the limitations recited therein are inherent to any electrochemical cell defined by claim 1.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 35 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The protonic polymers listed in claim 35 are not reasonably taught within the construct of the disclosed invention and claims directed to such do not comply with the written description requirement. The only recitation of the materials of claim 35 is in paragraph 3 of the background disclosure and appear to teach away from these materials. Upon reviewing the disclosure of the invention, the protonic polymer is s-PEEK or Nafion and not a sulfonated polystyrene, sulfonated polyaromatic or PBI/phosphoric acid moiety. Therefore the invention of claim 35 is held to introduce new matter to the claimed invention.

8. Claim 41 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The specific nature of the ionic bonding between the electrolyte and the electrodes critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Neither the specification nor the claims sets forth a clear description of the ionic bonding requisite of claim 41. In addition it does not define the manner by which the ionic bonds are formed nor what constituents are

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exemplary of the opposing charged species which would be involved in the ionic bonding. In addition it is unclear whether the bonding occurs between the gas diffusion electrode of the electrode, the catalyst material, the catalyst support or combinations thereof. Thus the claim is not yet held to comply with U.S.C. 112, first paragraph since it lacks sufficient enabling disclosure such that one of ordinary skill in the art would reasonably and readily understand the invention claimed therein.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 41 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 41 recites the limitation "the one or more electrodes" in line 2. There is insufficient antecedent basis for this limitation in the claim. In addition neither claims 1, 36 nor 38 (to which claim 41 is dependent) recite one or more electrodes.

### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-4, 6-13 and 35-41 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/780,968 in view of either U.S. Patent No. 6,969,563 (McLean) or EP 1202365 (EP '365). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/780,968 claims:

I. (Original) An electrochemical cell comprising a curable perfluoro-sulfonate ionomer based electrolyte composition, wherein the electrolyte composition comprises: a. between 10 wt% and 50 wt% of perfluoro-sulfonate ionomer (PFSI) comprising acidic groups for transporting protons; b. between 10 wt% and 89 wt% of a monomer for dissolving the PFSI; c. between 1 wt% and 60 wt% of a cross linking agent having at least two vinyl functionalities; and d. wherein upon combining the PFSI, monomer and cross linking agent, a curable electrolyte solution is formed with at least 50 wt% of the above components based on the total weight percent of the formed solution. 2.

(Original) The electrochemical cell of claim 1, further comprising a quantity of initiator sufficient to cure the composition when using a procedure comprising of photo-curing, thermal curing and combinations thereof. 3. (Original) The electrochemical cell of claim 1, wherein the PFSI comprises acid groups. 4. (Original) The electrochemical cell of

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claim 1, wherein the monomer is a vinyl monomer bearing an acidic group. 5. (Original)

The electrochemical cell of claim 4, wherein the acidic group comprises a sulfonic acid group, a phosphonic acid group, a carboxylic acid group, and combinations thereof. 6.

(Original) The electrochemical cell of claim 1, wherein the cross-linking agent vinyl functionalities are divinyl derivatives of an organic compound. 7. (Original) The

electrochemical cell of claim 6, wherein the organic compound is selected from the group consisting of an aliphatic, an aromatic, a heteroaromatic and combinations

thereof. 8. (Original) The electrochemical cell of claim 6, wherein the organic compound is selected from the group consisting of sulfonic acid, sulfones, phosphates,

phosphones, phosphonic acid, carboxylates, carboxylic acid, acrylates, methylacrylates, acrylamides, methacrylamides, and combinations thereof. 9. (Original) The

electrochemical cell of claim 1, wherein the cross linking agent vinyl functionality is a trivinyl derivative of an organic compound. 10. (Original) The electrochemical cell of

claim 9, wherein the organic compound is selected from the group consisting of sulfonic acid, sulfones, phosphates, phosphones, phosphonic acid, carboxylates, carboxylic

acid, acrylates, methylacrylates, acrylamides, methacrylamides, and combinations thereof. 11. (Original) The electrochemical cell of claim 1, wherein the curable liquid

electrolyte solution further comprises an elasticizing agent. 12. (Original) The

electrochemical cell of claim 1, wherein the elasticizing agent is a polymerizable vinyl monomer to enhance the toughness of structure of the cured electrolyte. 13. (Original)

The electrochemical cell of claim 1, consisting of: a. between 20 wt% and 40 wt% of a

PFSI comprising acidic groups for transporting protons; b. between 20 wt% and 70 wt%



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of a monomer for dissolving the PFSI; and c. between 5 wt% and 50 wt% of a cross linking agent having at least two vinyl functionalities. 14. (Original) A fuel cell with a curable electrolyte, wherein the curable electrolyte comprises: a. between 10 wt% and 50 wt% of a perfluoro sulfonate ionomer (PFSI) comprising acidic groups for transporting protons; b. between 10 wt% and 89 wt% of a polar monomer; c. a polar solvent for dissolving the polar monomer; d. between 1 wt% and 60 wt% of a cross linking agent having at least two vinyl functionalities; and e. wherein upon combining the PFSI, polar vinyl monomer, polar solvent, and cross linking agent, a curable electrolyte solution is formed with at least 50 wt% of the above components based on the total weight percent of the formed solution. 15. (Original) The fuel cell of claim 14, wherein the polar solvent is water. 16. (Original) The fuel cell of claim 14, wherein the polar solvent is organic. 17. (Original) The fuel cell of claim 14, wherein the polar solvent comprises dimethylformamide, dimethylacetamide, n-methylpyrrolidinone and combinations thereof. 18. (Original) The fuel cell of claim 14, wherein the polar monomer is a vinyl monomer bearing an acidic group. 19. (Original) The fuel cell of claim 18, wherein the acidic group comprises a sulfonic acid group, a phosphonic acid group, a carboxylic acid group and combinations thereof. 20. (Original) The fuel cell of claim 14, wherein the cross linking agent is a divinyl derivative of an organic compound. 21. (Original) The fuel cell of claim 20, wherein the organic compound comprises an aliphatic, an aromatic, a heteroaromatic, and combinations thereof. 22. (Original) The fuel cell of claim 20, wherein the organic compound comprises a sulfonic acid, a sulfone, a phosphate, a phosphone, a phosphonic acid, a carboxylate, a carboxylic acid,

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an acrylate, a methacrylate, an acrylamide, a methacrylamide, and combinations thereof. 23. (Original) The fuel cell of claim 14, wherein the cross linking agent is a trivinyl derivative of an organic compound. 24. (Original) The fuel cell of claim 23, wherein the organic compound comprises sulfonic acid, phosphates, phosphonic acid, carboxylates, carboxylic acid, acrylates, methacrylates, acrylamides, methacrylamides, and combinations thereof. 25. (Original) The fuel cell of claim 14, wherein the PFSI comprises sulfonic acid, carboxylic acid, and combinations thereof. 26. (Original) The fuel cell of claim 14, further comprising an elasticizing agent. 27. (Original) The fuel cell of claim 26, wherein the elasticizing agent is a polymerizable vinyl monomer to enhance the toughness of structure of the cured electrolyte. 28. (Original) The fuel cell of claim 14, further comprising an initiator usable when the electrolyte is cured by photo-curing, thermal curing, and combinations of thereof.

The difference between the instant claim and copending Application No. 10/780,968 is that the instant claims generically recite a protonic polymer. Copending Application No. 10/780,968 claims a particular protonic polymer, which is PFSI and thus is a particular species of the genus of protonic polymer of the instant claims. Thus the claims of the copending application anticipate the broader claims of the instant application and reasonably raise a double patenting issue.

Furthermore it would have been obvious to modify the configuration of the claims of copending Application No. 10/780,968 such that the electrolyte is disposed within channels of the electrochemical cell as shown by McLean (see Fig. 1, reference character 14) depending on the design of the fuel cell. Thus the concept of

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incorporating electrolyte within channels of the fuel cell is obviated by the teachings of McLean. Alternatively, EP '365 discloses disposing electrolyte 3 within channels of a porous substrate (abstract). This arrangement provides for an electrolyte membrane which has requisite ionic conductivity while inhibiting swelling of the electrolyte membrane (abstract).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Response to Arguments***

12. The double patenting rejection stands since the application file has yet to provide evidence of the filing of a terminal disclaimer as stated by Applicant on page 19 of the response filed December 18, 2007. Since no terminal disclaimer has been filed and since there are no specific and convincing arguments presented to overcome the double patenting rejection, the rejection stands.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1, 3, 4, 6-13, 35-38 and 40-41 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer, of record, in view of EP 1202365 (EP '365).

Kiefer discloses a polymer electrolyte comprising a protonic polymer comprising acid groups, a vinyl phosphonic acid monomer and a cross-linking agent which includes a multiplicity of materials having at least two functionalities (abstract, examples and paragraph 139).

While the amounts of the constituents above are not clearly disclosed, pending a translation of this reference, it is noted that the claims are drawn to a product-by-process and that the end product of Kiefer and that of the instant claims which are identical in compositional elements will either inherently result in the same claimed product, else any differences would have been obvious to one of ordinary skill in the art

to control the degree of crosslinking and ionic conductivity of the resultant electrolyte membrane.

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

“The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113 (as applied to claims 1 and 13).

The protonic polymer comprises acid groups (paragraph 99 as applied to claim 3).

The vinyl monomer includes phosphonic acid (abstract as applied to claims 3 and 4).

The cross-linking agent includes various functionalities including carboxylic acids, carboxylates, acrylates, methacrylates, etc. and includes trivinyl compositions as well (para. 139 as applied to claims 6-10).

As discussed above, the combination suggests using vinyl monomer constituents in the mixture. The claimed elasticizing compound is a vinyl monomer.

Since the teachings of Kiefer and Singleton suggest using vinyl monomers in the mixture and since these vinyl monomers are generically the same as the claimed and unspecified vinyl monomer of claims 11 and 12, there is a reasonable expectation that the combination above already having a vinyl monomer present in the mixture will function as the claimed elasticizing element absent clear evidence to the contrary. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that Kiefer already employs a vinyl monomer and said vinyl monomer being the same as the generically claimed and generically disclosed vinyl monomer will provide some degree of elasticity and strength as recited in claims 11 and 12.

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

By example the polymer comprising PBI/phosphoric acid (para 214 as applied to claim 35). The nature of the protonic polymer conductor claim 35 being a membrane is not particularly germane to the claimed invention since the protonic polymer conductor is dissolved in the process of the product-by-process of claim 1. The composition of the protonic polymer of Kiefer is the same and the resultant final electrolyte composition in the prior art is held to be identical the composition of the electrolyte of claims 1 and 35.

The solvent can comprise water (paragraph 128 as applied to claims 36 and 37) or can be other polar solvents such as DMA (paragraph 214 as applied to claims 38 and 39).

Kiefer does not teach of disposing the electrolyte in channels of the cell however such a configuration is previously shown by EP '365 (abstract and Figs. 1-2). In Fig. 2 the electrolyte 3 is disposed within channels of the substrate. One of ordinary skill in the art would have found it obvious to modify the teachings of Kiefer with that of EP '365 since it would have provide an electrolyte membrane having increased resistance to swelling.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by reconfiguring the fuel cell structure to that disclosed by EP '365 which would include electrolyte channels as shown in Fig. 2 of EP '365 since it would have provided an and electrolyte membrane having increased resistance to swelling.

Regarding claim 40:

The electrodes are disposed on opposite sides of the electrolyte of EP '365 and one of ordinary skill in the art would have readily found it obvious to have the electrodes contact the electrolyte so that the electrochemical components of the electrochemical cells would be able to function as a fuel cell (as applied to claim 40).

Regarding claim 41:

As best as claim 41 is described in light of the specification, the difference not yet discussed is of ionically bonding the electrolyte to the electrodes.

The use of both mechanical and chemical bonding of fuel cell elements is readily understood by one of ordinary skill in the art.



Given that the electrolyte material of Kiefer is the same and that the electrode and catalyst materials are generically identical and in the absence of a clearer definition of the nature and extent of the ionic bonding of claim 41, there is a reasonable expectation that generation of ion species of each of these layers will at least temporarily form ionic bonds between oppositely charged species in each layer. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is the electrolyte material of Kiefer is the same and that the electrode and catalyst materials are generically identical and in the absence of a clearer definition of the nature and extent of the ionic bonding of claim 41, there is a reasonable expectation that generation of ion species of each of these layers will at least temporarily form ionic bonds between oppositely charged species in each layer.

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer or in view of EP '365 as applied to claim 1 above, and further in view of U.S. Patent No. 5,425,687 (Singleton).

The difference between claim 2 and Kiefer is that Kiefer does not clearly require the presence of an initiator.

Singleton is drawn to cross-linking of various ion exchange membranes wherein the mixture includes a cross-linker such as divinyl benzene (col. 5, ll. 35-40). The mixture further can include an initiator (paragraph bridging columns 5 and 6).

The motivation for using an initiator would have been readily apparent to the ordinary worker in the art so as to initiate the cross-linking.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by using an initiator since it would have provided the predictable result of initiating cross-linking. The selection of a known material based on its suitability for its intended use supported a

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prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In addition the presence of the initiator is requisite in the process and is not clearly a component in the claimed product recited in the product-by-process claims. Thus absent clear evidence to the contrary, the initiator is not necessarily held to further limit the end product since it only serves to initiate polymerization and is not shown to materially impact the claimed composition.

### ***Response to Arguments***

15. Applicant's arguments with respect to the references above failing to teach of the electrolyte composition disposed within one or more channels of an electrochemical cell have been considered but are moot in view of the new ground(s) of rejection. Furthermore, it is apparent that such a fuel cell combination is previously taught in the prior art as shown by the McLean reference.

Regarding the teachings of JP '291, Applicant additionally argues that the alternative rejection employing this reference does not disclose the weight percentages of the claimed components.

This argument is moot since the prior art rejections to JP '291 have been withdrawn.

### ***Claim Rejections - 35 USC § 103***

16. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer in view of EP '365 as applied to claim 38 above, and further in view of U.S. Patent No. 5,902,876 (Murata).

The difference not yet discussed is of the solvent comprising N,N DMA (claim 39).

Kiefer and use a polar solvent to dissolve the constituents of the electrolyte.

Kiefer teaches of using PBI which is dissolved in DMA (para 214).

It is further known to dissolve PBI in N,N-DMA as taught by Murata(col. 2, ~ll.15-25).

The motivation for using N,N-DMA is that it improves the life of the polymer. Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by selecting the DMA to be N,N-DMA since it would have provided the predictable result of improving the life of the polymer. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

### ***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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